HSS
Office of Health, Safety and Security

Health Advisory

Coronary Heart Disease (CHD): The Greatest Threat to U.S. Department of Energy's Aging Workforce and Mission

A Message From
Michael Ardaiz, MD, MPH, CPH,
Department of Energy's Chief Medical Officer

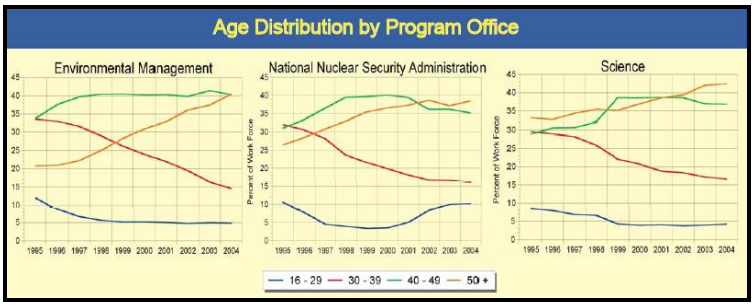
As Chief Medical Officer, I would like to make each of you aware of the greatest threat to the Department's aging workforce and mission. At first glance, it might appear that the greatest threat may be occupational injuries such as slips/trips, and falls, or occupational exposures to radiation and cancer-causing chemical toxins. Those hazards have long been targeted by largely effective health and safety programs such that DOE's aging workforce is generally at much lower risk from those hazards than other workers in the United States. ***Instead, we must consider the relatively greater threat of coronary heart disease (CHD).***

What We are Facing – CHD affects a staggering number of Americans and potentially DOE workers as indicated by the statistics drawn from the Center for Disease Control & Prevention's (CDC) National Health and Nutrition Examination Surveys (NHANES) and analyzed in a number of published scientific studies.

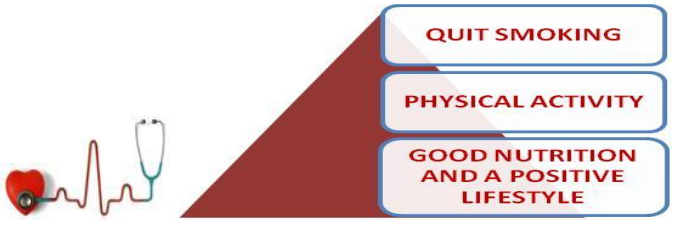
- ***Every 35 seconds,*** an American will suffer a myocardial infarction (MI, or heart attack).
- ***Every minute,*** someone will die from an MI.
- ***Nearly 1,300,000 Americans*** will have a new or recurrent MI this year .
- ***MI has affected 3.6 percent of American adults*** (4.7 percent for men and 2.6 percent for women).
- ***The average age*** at which a first MI occurs is 64.5 for men and 70.3 for women, but there is a wide age range of ages depending upon the length and intensity of exposure to risk factors.
- ***Nearly 8 percent or 18,000,000 American adults have CHD*** (9.1 percent for men and 7.0 percent for women).
- ***The lifetime risk of developing CHD*** after age 40 is 49 percent for men and 32 percent for women.
- ***CHD causes one of every six deaths*** in the United States.

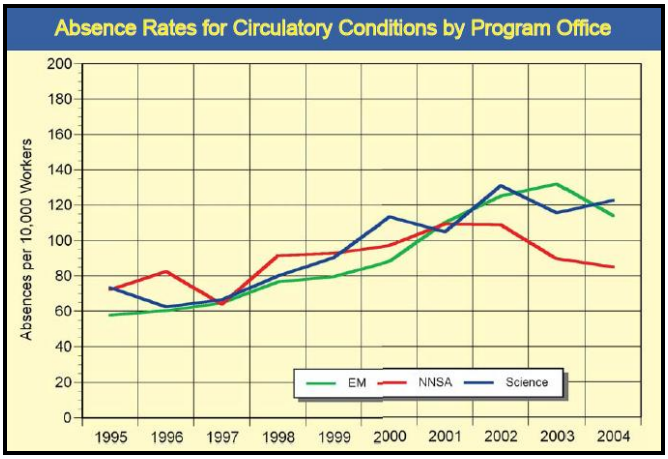
While the threat of CHD has historically been regarded as non-work-related by employers, DOE has been among the leaders in a nation which increasingly recognizes that the effects of non-work-related illness upon individual workers and workforces have both direct and indirect implications for employers.

For example, data provided by the Office of Health, Safety, and Security's Injury and Illness Surveillance Progam consisting of self-reported information from about 60% of the DOE workforce confirms that as a workforce, we are definitely aging. Between 1995 and 2004, ***the number of workers 50 years of age or older doubled***, while ***workers aged 30-39 years decreased by about half*** over the same period. Note that workers within all three of the Program Offices included in the following graphs include potentially tens of thousands of workers 50 years of age or older who undertake relatively physically-demanding tasks while supporting the mission.



In addition, circulatory conditions of which CHD is a part have an impact not only on the health status of DOE workers, but on their ability to be present for work (i.e., absenteeism). ***In fact, over the 10-year period from 1995 to 2004, DOE documented that worker absence rates associated with circulatory conditions increased by about 40%!***





Most importantly, every single fatality of a DOE worker associated with CHD represents an opportunity for us to recommit ourselves to the struggle to achieve "heart health."

What DOE can do – The Department supports "heart health" through the establishment of comprehensive worker safety and health programs which can reduce the occurrence of CHD among DOE workers and the impact of CHD upon the Department's mission. Perhaps the most evident support for the prevention of CHD among DOE workers is embodied in the 10 CFR 851, DOE's regulation for worker safety and health programs (WSHP) for contractor workers. According to Appendix A to Part 851, WSHPs "must include measures to identify and manage the principal preventable causes of premature morbidity and mortality affecting worker health and productivity." As specified in the aforementioned IISP report, "**absence rates were 3 times higher among workers with high blood pressure than among workers without a reported diagnosis of high blood pressure,"** making the prevention and management of this significant risk factor for CHD very likely a cost-effective intervention among DOE WSHPs.

Additional sources of Departmental support for "heart health" include the following HSS-sponsored programs and materials:

- **Guidance for DOE employers regarding the reporting of potentially work-related MI's** assists health and safety professionals to recognize the potential existence of causes or contributors to CHD in the workplace (http://www.hss.energy.gov/CSA/csp/safety_bulletins/sb-2008-03.pdf)
- **Guidance for DOE employers supporting the use of automated external defibrillators (AED)** (http://www.hss.energy.gov/CSA/csp/safety_bulletins/safety_bulletin_2007-07.pdf)
- **The Office of Health, Safety, and Security's (HSS)** ***Injury and Illness Surveillance Program (IISP)***, as noted above, which provides vital data to support the implementation of workplace interventions against risk factors leading to CHD (http://www.orau.gov/iisp/)
- **Web-based resources to inform DOE workers of the hazard of CHD, as well as opportunities to eliminate or reduce those risk factors** (http://www.hss.doe.gov/HealthSafety/occmed/heartdiseaseprevention.html)

What DOE Workers Can Do – CHD is caused by atherosclerosis (ath"er-o-skleh-RO'sis), the narrowing of the coronary arteries due to fatty build-ups of plaque which are strongly associated with risk factors. Nine easily measured and potentially modifiable risk factors result in the development of coronary plaques and account for over 90 percent of the risk of an initial acute MI. The effect of these risk factors is consistent in men and women across different geographic regions and by ethnic group, making the study applicable worldwide. These nine risk factors include cigarette smoking, abnormal blood lipid levels, hypertension, diabetes, abdominal obesity, a lack of physical activity, low daily fruit and vegetable consumption, alcohol overconsumption and psychosocial index.

A personal assessment can begin with a tool such as the American Heart Association's (AHA) "Life's Simple 7" which is convenient, requires just a few minutes to complete, and is absolutely free (http://mylifecheck.heart.org/).

We Can Assist You – For specific questions or concerns, please contact the following individuals:

DOE Occupational Medicine:

- Michael Ardaiz, MD, MPH, CPH
  michael.ardaiz@hq.doe.gov (202)360-3650
- Claudia Beach, RN, BA, COHN-S
  claudia.beach@hq.doe.gov (301)903-9826

DOE Office of Corporate Safety Analysis:

- William Roege
  william.roege@hq.doe.gov (301)903-0502
- Charles Lewis
  charles.lewis@hq.doe.gov (301)903-1250

DOE Office of Injury and Illness Prevention Programs:

- Gerald Petersen, PhD
  gerald.petersen@hq.doe.gov (301)903-2340
- Clifton Strader, PhD
  cliff.strader@hq.doe.gov (301)903-5799

DOE Employee Assistance Program

- Evelyn Joy
  evelyn.joy@hq.doe.gov (202)586-8420

CORONARY HEART DISEASE (CHD): The Greatest Threat to U.S. Department of Energy's Aging Workforce and the Departments Mission

INTRODUCTION

Coronary heart disease (CHD) is *the leading cause of death in the United States*. That's why it's so important to reduce your risk factors, know the warning signs, and know how to respond quickly and properly if warning signs occur.

Also, it's important to recognize that heart disease generally begins during early adulthood at which time even modest exposures to tobacco and elevated blood pressure, cholesterol, and sugar begin to limit our coronary blood flow. In fact, after we reach the age of 40 years, the relative risk of critical heart disease (ie, over 70% narrowing of any single artery) and a heart attack doubles. This is especially concerning for DOE's workforce with an average age of subpopulations potentially exceeding 50 years.

NOW is the time for you to address your risk factors, learn how you might improve your heart health, and be prepared to respond to the warning signs of a heart attack. Clearly, heart health should be our highest priority as individuals, as employees, and as an organization.

ADDRESSING YOUR RISK FACTORS

There is a tremendous amount of scientific evidence identifying both non-modifiable and modifiable risk factors, as well as contributors to the development of heart disease (see Table 1). Of course, the greater the number of risk factors you have, the greater your chance of developing heart disease. Also, the greater the level of each risk factor, the greater the associated risk. For example, a person with a total cholesterol of 300 mg/dL has a greater risk than someone with a total cholesterol of 245 mg/dL, even though everyone with a total cholesterol greater than 240 mg/dL is considered high-risk.

NON-MODIFIABLE RISK FACTORS	MODIFIABLE* RISK FACTORS	MODIFIABLE* CONTRIBUTORS
•Increasing Age •Male Sex (Gender) •Heredity (Including Race)	•Tobacco Use (Including Smokeless) •High Blood Cholesterol •High Blood Pressure •Physical Inactivity •Obesity and Overweight •Diabetes Mellitus	•Stress •Alcohol •Diet and Nutrition

*Risk of CHD may be reduced or even eliminated through attention to these concerns!

IMPROVING YOUR HEART HEALTH

Sounds simple doesn't it? So why is heart disease still the single greatest cause of death in the U.S.? One reason is undeniably a lack of commitment to a heart-healthy lifestyle. A heart-healthy lifestyle requires your strict attention to ALL of the potential risks identified in the heart below.

By following these three simple steps you can reduce all of the modifiable risk factors for heart disease and heart attack:

1) Avoid tobacco. If you smoke OR use smokeless tobacco products, quit. If someone in your household or in your workplace does, encourage them to quit. You can learn more about tobacco use, its relationship with cardiovascular disease, and the most effective ways to succeed in quitting by visiting the websites of the American Heart Association (AHA), the U.S. Surgeon General, and possibly of your own health insurer for plans, tips, tools, and perhaps insurer-covered services or products to help you quit.

2) Choose good nutrition. A healthy diet is one of the best weapons you have to fight heart disease. The food you eat (and the amount) directly impacts other modifiable risk factors: cholesterol, blood pressure, diabetes and overweight.

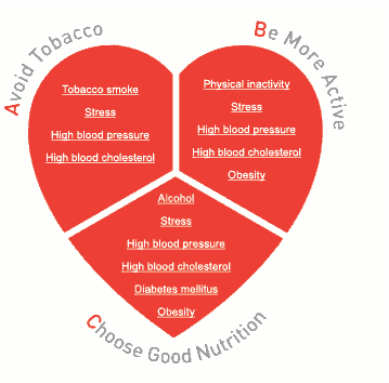
In the process of choosing good nutrition, reduce your blood cholesterol with every meal by reducing your intake of saturated fat, trans fat, and cholesterol, while increasing the proportion of "good" or smaller cholesterol forms through exercise. Once lodged in the walls of your arteries, cholesterol plaques can progress slowly to segments of critical narrowing which produce warning signs such as exertional angina (ie, chest pain during physical activity), OR less often rupture at an early stage without any warning - so the less cholesterol plaques, the better!

Here's the lowdown on where those numbers need to be:

A) Total Cholesterol: should be less than 200 mg/dL

B) LDL (bad) Cholesterol:
- If you're at low risk for heart disease: LDL should be less than 160 mg/dL
- If you're at intermediate risk for heart disease: LDL should be less than 130 mg/dL
- If you're at high risk for heart disease (including those with heart disease or diabetes): LDL should be less than 100mg/dL

C) HDL (good) Cholesterol: should be 40 mg/dL or higher for men or 50 mg/dL or higher for women
Triglycerides: should be less than 150 mg/dL



A diet rich in vegetables, fruits, whole-grain and high-fiber foods, fish, lean protein and fat-free or low-fat dairy products is the key. And to maintain a healthy weight, coordinate your diet with your physical activity level so you're using up as many calories as you take in.

If diet and physical activity alone don't get those numbers down, then medication may be the key. Take it just like the doctor orders.

3) Lower high blood pressure. Shake that salt habit, take your medications as recommended by your doctor and get moving. Those numbers need to get down and stay down. Your goal is less than 120/80 mmHg.

4) Be physically active every day. Research has shown that getting at least 30 minutes of physical activity on 5 or more days of the week can help lower blood pressure, lower cholesterol and keep your weight at a healthy level. But something IS better than nothing. If you're doing nothing now, start out slow. Even 10 minutes at a time may offer some health benefits. Studies show that people who have achieved even a moderate level of fitness are much less likely to die early than those with a low fitness level.

5) Aim for a healthy weight. Obesity is an epidemic in America, not only for adults but also for children. An epidemic is when a health problem is out of control and many people are affected by it. Fad diets and supplements are not the answer. Good nutrition, controlling calorie intake and physical activity are the only way to maintain a healthy weight. Obesity places you at risk for high cholesterol, high blood pressure and insulin resistance, a precursor of type 2 diabetes — the very factors that heighten your risk of cardiovascular disease. Your Body Mass Index (BMI) can help tell you if your weight is healthy.

6) Manage your diabetes. Cardiovascular disease is the leading cause of diabetes-related death. People with diabetes are two to four times more likely to develop cardiovascular disease due to a variety of risk factors, including high blood pressure, high cholesterol, smoking, obesity and lack of physical activity.

7) Reduce stress. Some scientists have noted a relationship between coronary heart disease risk and stress in a person's life that may affect the risk factors for heart disease and stroke. For example, people under stress may overeat, start smoking or smoke more than they otherwise would. Research has even shown that stress reaction in young adults predicts middle-age blood pressure risk.

WARNING SIGNS OF A HEART ATTACK

Some heart attacks are sudden and intense — the "movie heart attack," where no one doubts what's happening. But most heart attacks start slowly, with mild pain or discomfort. Often people affected aren't sure what's wrong and wait too long before getting help. Here are signs that can mean a heart attack is happening:

- **Chest discomfort.** Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes, or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness or pain.
- **Discomfort in other areas of the upper body.** Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- **Shortness of breath.** This may occur with or without chest discomfort.
- **Other signs**. These may include breaking out in a cold sweat, nausea or lightheadedness

Learn the signs, but remember this: Even if you're not sure it's a heart attack, have it checked out (tell a doctor about your symptoms). Minutes matter! Fast action can save lives — maybe your own. Don't wait more than five minutes to call 9-1-1 or your emergency response number. Calling 9-1-1 is almost always the fastest way to get lifesaving treatment. Emergency medical services (EMS) staff can begin treatment when they arrive — up to an hour sooner than if someone gets to the hospital by car. EMS staff are also trained to revive someone whose heart has stopped. Patients with chest pain who arrive by ambulance usually receive faster treatment at the hospital, too. It is best to call EMS for rapid transport to the emergency room.

ADDITIONAL RESOURCES

The following are links to resources that provide educational materials or guidelines on the full range of concerns associated with heart health:

- http://www.hss.doe.gov/HealthSafety/occmed/heartdiseaseprevention.html
- www.americanheart.org/
- www.cdc.gov/heartdisease/
- http://www.surgeongeneral.gov/index.html
- http://www.nhlbi.nih.gov/health/public/heart/index.htm
- http://198.246.98.21/niosh/programs/crcd/